

Traveling Wave, Broadband, and Frequency Independent Antennas

Log Periodic Dipole Array Design

Design log-periodic dipole arrays, of the form shown in the figure below, each with directivities of 9 dB, input impedance of 75 ohms, and each with the following additional specifications. Cover the:

- VHF TV Channels 2-6 (54 – 88 MHz). Use diameters of 1.9095 and 1.1169 cm for the largest and smallest elements, respectively.
- VHF TV Channels 7-13 (174 - 216 MHz). Use diameters of 0.6 and 0.476 cm for the largest and smaller elements, respectively.
- UHF TV Channels (512 – 806 MHz). The largest and smallest elements should have diameters of 1.169 and 0.9525 cm, respectively.

In each design, the ratio of length to diameter is the same for all elements.

For each design, find the optimized σ and τ , aperture angle α , designed bandwidth B_s , total length L , number of elements N , relative mean spacing σ' , average impedance Z_a , antenna impedance Z_0 , and spacing s .

